REMARKS

In the Office Action mailed December 5, 2002:

Claim 14 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claims 1, 3-4, 12-13, 16, 19, and 21 were rejected under 35 U.S.C. 102(b), as being anticipated by U.S. Patent No. 5,980,991 to Sakamoto et al.

Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991) in view of Granneman et al. (U.S. 5,294,572).

Claims 5 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (5,980,991).

Claims 7-9 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991) in view of Traum et al. (U.S. 3,866,926).

Claims 14-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991) in view of Canfield et al. (U.S. 4,531,047).

Claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991), Canfield et al. (U.S. 4,531,047) and Okubo et al. (Japanese Patent No. 01-082453).

Claim 10 was objected to as being dependent upon a rejected base claim.

Claim 13 was objected to for reciting the extra words in the phrase "said a high temperature."

Specification

Applicants have amended the specification on page 11 to provide the correct reference for Marks' Standard Handbook for Mechanical Engineers. No new matter has been added.

Claims

Applicants have canceled claims 3 and 4. Applicants have amended claims 1 and 21 to recite a thermally isolating interface that is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F). Furthermore, Applicants have amended claims 1, 20 and 21 to recite that the chambers are vacuum chambers. Finally, Applicants have amended claims 1, 20 and 21 to recite that the chambers and the apparatus together form

a closed environment having an internal pressure that is less than standard atmospheric pressure. Applicants have amended claims 2, 5 and 6 to provide correct antecedent basis, claim 13 to correct a typographical error, and claim 14 for clarity. No new matter has been added.

Status of Claim 20

Section 707.07(i) of the Manual of Patent Examining Procedure (Original Eighth Edition, August 2001) states that, in every office action, each pending claim should be mentioned by number, and its treatment or status given. In the December 5, 2002 office action, the Examiner failed to state the status of pending claim 20. Applicants have amended claim 20 as indicated above. Applicants believe that claim 20, as amended, is fully patentable.

Claim Objections

The Examiner has objected to claim 13 because of a typographical error. With this amendment, Applicants have corrected the typographical error. The Examiner further objected to claim 10 for being dependent upon a rejected base claim. Applicants believe that claim 10 is fully patentable in light of the claim amendments to the claim from which claim 10 depends.

The 35 U.S.C. 112, second paragraph, rejection should be withdrawn

The Examiner has rejected claim 14 under 35 U.S.C. 112, second paragraph, as being indefinite for reciting the phrase "a heater in a metal shape." Applicants have amended claim 14 to recite that the heater is *encased* in a metal shape. A heater encased in a metal shape is described in paragraph 52 of the specification (*e.g.*, a Watlow cast-in or interference fit product). In light of the amendment to claim 14, Applicants request that the 35 U.S.C. 112 rejection of claim 14 be withdrawn.

The 35 U.S.C. 102 rejection should be withdrawn

The Examiner has rejected claims 1, 3-4, 12-13, 16, 19, and 21 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,980,991 to Sakamoto et al. Applicants have

amended claims 1 and 21 to recite that the thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F). Sakamoto does not disclose a thermally isolating interface made of metal. The thermally isolating interface of Sakamoto is made of refractory glass. See col. 22 lines 57-59 of Sakamoto et al. For this reason, claims 1 and 21 as amended are not anticipated by Sakamoto. Claims 3-4, 12-13, 16, and 19 ultimately depend from claim 1 and are therefore patentable over Sakamoto for at least the same reason that claim 1, as amended, is patentable over Sakamoto. Applicants therefore request that the 35 U.S.C. 102(b) rejection be withdrawn.

The 35 U.S.C. 103(a) rejections should be withdrawn

Claim 2. Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991) in view of Granneman et al. (U.S. 5,294,572). The Examiner relies on Sakamoto to teach the invention recited in claim 2 with the exception that one of the chambers is a high temperature chamber and the second chamber is a transfer chamber. For this, the Examiner relies on Granneman. Granneman teaches a conventional cluster tool. The Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a heat isolating interface between a high temperature chamber and a transfer chamber in Sakamoto in order to ensure that only a minimum of heat flow is able to reach the transfer chamber as taught by Granneman.

Applicants respectfully traverse the rejection in light of the amendments to claim 1. Any combination of Sakamoto and Granneman fails to teach or suggest the use of a thermally isolating interface that is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F). Furthermore, there is no reason to provide a heat isolating interface between two chambers in Sakamoto. Each chamber in Sakamoto is provided with its own heater (Sakamoto, col. 17, lines 39-47). Therefore, Sakamoto already has complete thermal control over the chamber temperatures, rendering the modification suggested by the Examiner both unnecessary.

Claims 5 and 6. Claims 5 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (5,980,991). The Examiner correctly notes that Sakamoto

fails to teach the thermally isolating interface is made of stainless steel. The Examiner then notes that Sakamoto teaches the use of stainless steel as a construction material. Therefore, the Examiner reasons that it would have been obvious to use stainless steel in the thermally isolating interface recited in the pending claims.

Applicants traverse the rejection. First, claim 1 has been amended to recite that the thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F). Such a feature is not taught or suggested by Sakamoto (see 102 comments above). Second, the section of Sakamoto relied upon by the Examiner, column 27, rows 53-59, is referring to the material used to make the *rollers* on a conveyor belt, not the material used to separate two chambers. Thus, any suggestion that column 27, rows 53-59, can be relied upon to teach or suggest the thermally isolating interface of the claimed invention is erroneous.

Claims 7-9 and 11. Claims 7-9 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991) in view of Traum et al. (U.S. 3,866,926). The Examiner reasons that Sakamoto discloses the invention substantially as claimed with the exception that the reference fails to teach the face of the apparatus including a recess such that when the face abuts the port, a thermally isolating volume is defined within the recess. For this feature, the Examiner relies on Traum, which teaches a carburetor gasket.

Applicants traverse the rejection. First, Applicants have amended claim 1 to recite that the thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F). Such a feature is not taught or suggested by Sakamoto (see 102 comments above). Second, a carburetor gasket is not used in an apparatus through which a substrate is transferred between a first vacuum chamber and a second vacuum chamber as recited in claim 1. Traum is completely nonanalogous art. Therefore, Applicants believe that there is no motivation to combine the features of Traum and Sakamoto.

Claims 14-17. Claims 14-17 have been rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991) in view of Canfield et al.

(U.S. 4,531,047). The Examiner reasons that Sakamoto discloses the invention substantially as claimed with the exception that the reference fails to teach or suggest the heating element in the passageway. For this feature, the Examiner relies on Canfield, which teaches a clip-mounted quartz tube electric heater. Applicants respectfully traverse the rejection on the basis that any combination of Sakamoto and Canfield does not teach or suggest each and every limitation of claims 14-17 in view of the amendments to claim 1, from which claims 14-17 depend. Specifically, claim 1 recites that the thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F). Sakamoto does not teach or suggest such a feature. The clip-mounted quartz tube electric heaters of Canfield fail to remedy this deficiency in Sakamoto.

Claim 18. Claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakamoto et al. (5,980,991), Canfield et al. (U.S. 4,531,047) and Okubo et al. (Japanese Patent No. 01-082453). The Examiner reasons that the combination of Sakamoto and Canfield discloses the invention substantially as claimed with the exception that the references fail to teach a reflecting parabolic mirror. For this feature, the Examiner relies on Okubo which teaches a parabolic mirror designed to improve lamp efficiency. Applicants respectfully traverse the rejection. First, Applicants believe that any combination of Sakamoto, Canfield, and Okubo does not teach or suggest each and every limitation of claim 18 in view of the amendments to claim 1, from which claim 18 depends. Specifically, claim 1 recites that the thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F). Sakamoto does not teach or suggest such a feature. The clip-mounted quartz tube electric heaters of Canfield and the parabolic mirror designed to improve lamp efficiency of Okubo fail to remedy this deficiency in Sakamoto. Second, the parabolic mirror disclosed in Okubo has a completely different purpose from the parabolic mirror recited in claim 18. The mirror in Okubo is designed to prolong lamp life whereas the mirror recited in claim 18 is designed to evenly heat a substrate. Because of these completely different purposes, it would not have been obvious to combine the features of Okubo with any apparatus that is used to evenly heat a substrate.

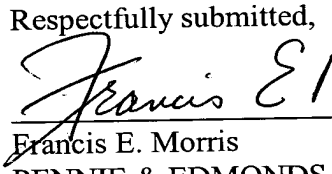
For the reasons discussed above, Applicants respectfully request that the 35 U.S.C 103 (a) rejection be withdrawn.

In view of the foregoing, Applicants believe that all of the claims are now in condition for allowance and respectfully requests the Examiner to pass the subject application to issue. If for any reason the Examiner believes any of the claims are not in condition for allowance, he is encouraged to phone the undersigned at (650) 849-7777 so that any remaining issues may be resolved.

No additional fee is believed due for filing this response. However, if a fee is due, please charge such fee to Pennie & Edmonds LLP's Deposit Account No. 16-1150.

Respectfully submitted,

Date: February 3, 2003



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APPENDIX A

Changes to the Specification

In the following amended paragraph, all insertions are doubly underlined and all omitted material is bracketed.

Please replace the paragraph 45 beginning on page 11 with:

[0045] Reference to a wide range of materials that are suitable for use in the present invention may be found in Marks' Standard Handbook for Mechanical Engineers, [*id,*] Ninth Edition, Avallone & Baumeister III *eds*., McGraw-Hill Inc., New York, including the Table at 6-11. Thus, possible materials for thermally isolating interface 108 include, platinum, as well as various alloys of iron and chromium including steel with an American Iron and Steel Institute designation of C1020 (hot-worked) or 304 (sheet). However, in a preferred embodiment, the material used for thermally isolating interface 108 is any common form of stainless steel.

APPENDIX B

Changes to the Claims

In the following amended claims, all insertions are underlined by a single line and all omitted material is bracketed.

1. (Amended) An apparatus through which a substrate is transferred between a first vacuum chamber and a second vacuum chamber, wherein said first vacuum chamber is maintained at a high temperature relative to a temperature maintained within said second vacuum chamber, said second vacuum chamber including a port; said apparatus comprising:

a passageway for receiving said substrate; and

a thermally isolating interface that reduces heat transfer from said first vacuum chamber to said second vacuum chamber, said thermally isolating interface allowing for transfer of said substrate between said apparatus and said second vacuum chamber, said thermally isolating interface having a face with a border disposed on said face, the border defining a hole in said thermally isolating interface having dimensions such that said substrate is transferrable through said thermally isolating interface;

wherein said thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F) and wherein said first vacuum chamber, said apparatus, and said second chamber are sealed together to form a closed environment having an internal pressure that is less than standard atmospheric pressure.

2. (Amended) The apparatus of claim 1 wherein said first vacuum chamber is a heat chamber or a high temperature processing chamber and said second vacuum chamber is a transfer chamber.

5. (Amended) The apparatus of claim [4] 1 wherein said thermally isolating interface is made of stainless steel.

6. (Amended) The apparatus of claim [4] 1 wherein said thermally isolating interface is composed of a stainless steel having a thermal conductivity coefficient of about 106 Btu inch/(hr)(ft^2)(°F).

13. (Amended) The apparatus of claim 1 wherein said passageway further comprises a heating element for maintaining said apparatus at a temperature that is proximate to said [a] high temperature.

14. (Amended) The apparatus of claim 13 wherein said heating element comprises a heater that is encased in a metal shape.

20. (Amended) An apparatus through which a substrate is transferred between a first vacuum chamber and a second vacuum chamber, wherein said first vacuum chamber is maintained at a high temperature relative to a temperature maintained in said second vacuum chamber, said second vacuum chamber including a port; said apparatus comprising:

a passageway for receiving said substrate; and

a stainless steel interface that reduces heat transfer from said first vacuum chamber to said second vacuum chamber, said stainless steel interface allowing for transfer of said substrate between said apparatus and said second chamber, said stainless steel interface having a face with a border disposed on said face, the border defining a hole in said stainless steel interface having dimensions such that said substrate is transferrable through said stainless steel interface;

wherein said first vacuum chamber, said apparatus, and said second chamber are sealed together to form a closed environment having an internal pressure that is less than standard atmospheric pressure.

21. (Amended) An apparatus through which a substrate is transferred between a first vacuum chamber and a second vacuum chamber, wherein said first vacuum chamber is maintained at a high temperature relative to an ambient temperature of said second vacuum chamber, said second vacuum chamber including a port; said apparatus comprising:

a passageway for receiving said substrate, said passageway including a heating element for maintaining said apparatus at a temperature that is proximate to said high temperature; and

an interface that reduces heat transfer from said first vacuum chamber to said second vacuum chamber, said interface allowing for transfer of said substrate between said apparatus and said second vacuum chamber, said interface having a face with a border disposed on said face, the border defining a hole in said interface having dimensions such that said substrate is transferrable through said interface;

wherein said thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F) and wherein said first vacuum chamber, said apparatus, and said second chamber are sealed together to form a closed environment having an internal pressure that is less than standard atmospheric pressure.

APPENDIX C

Pending Claims Upon Entry of the Amendment

1. (Amended) An apparatus through which a substrate is transferred between a first vacuum chamber and a second vacuum chamber, wherein said first vacuum chamber is maintained at a high temperature relative to a temperature maintained within said second vacuum chamber, said second vacuum chamber including a port; said apparatus comprising:

a passageway for receiving said substrate; and

a thermally isolating interface that reduces heat transfer from said first vacuum chamber to said second vacuum chamber, said thermally isolating interface allowing for transfer of said substrate between said apparatus and said second vacuum chamber, said thermally isolating interface having a face with a border disposed on said face, the border defining a hole in said thermally isolating interface having dimensions such that said substrate is transferrable through said thermally isolating interface;

wherein said thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F) and wherein said first vacuum chamber, said apparatus, and said second chamber are sealed together to form a closed environment having an internal pressure that is less than standard atmospheric pressure.

2. (Amended) The apparatus of claim 1 wherein said first vacuum chamber is a heat chamber or a high temperature processing chamber and said second vacuum chamber is a transfer chamber.

5. (Amended) The apparatus of claim 1 wherein said thermally isolating interface is made of stainless steel.

6. (Amended) The apparatus of claim 1 wherein said thermally isolating interface is composed of a stainless steel having a thermal conductivity coefficient of about 106 Btu inch/(hr)(ft^2)(°F).

7. The apparatus of claim 1, wherein said face includes a recess such that, when said face abuts said port, a thermally isolating volume is defined within said recess.

8. The apparatus of claim 7 wherein said thermally isolated volume is occupied by a composition having a thermal conductivity coefficient of less than 1200 Btu inch/(hr)(ft^2)(°F).

9. The apparatus of claim 8 wherein said composition is air or an insulating material.

10. The apparatus of claim 7 wherein said recess is beveled.

11. The apparatus of claim 7 wherein a cross section of said recess is defined by a shape selected from the group consisting of a sawtooth pattern, a repeating pattern, a curve, and a polynomial equation.

12. The apparatus of claim 1 wherein said high temperature is in a range between about 250°C to about 625°C.

13. (Amended) The apparatus of claim 1 wherein said passageway further comprises a heating element for maintaining said apparatus at a temperature that is proximate to said high temperature.

14. (Amended) The apparatus of claim 13 wherein said heating element comprises a heater that is encased in a metal shape.

15. The apparatus of claim 13 wherein said heating element is a coil wrapped about a ceramic base.

16. The apparatus of claim 13 wherein said passageway further comprises a heat distribution mechanism for distributing heat generated by said heating element.

17. The apparatus of claim 13 wherein said heat distribution mechanism is a reflective surface.

18. The apparatus of claim 17 wherein said heat distribution mechanism is a parabolic mirror.

19. The apparatus of claim 1 wherein said substrate is a semiconductor substrate or a glass substrate.

20. (Amended) An apparatus through which a substrate is transferred between a first vacuum chamber and a second vacuum chamber, wherein said first vacuum chamber is maintained at a high temperature relative to a temperature maintained in said second vacuum chamber, said second vacuum chamber including a port; said apparatus comprising:

a passageway for receiving said substrate; and

a stainless steel interface that reduces heat transfer from said first vacuum chamber to said second vacuum chamber, said stainless steel interface allowing for transfer of said substrate between said apparatus and said second chamber, said stainless steel interface having a face with a border disposed on said face, the border defining a hole in said stainless steel interface having dimensions such that said substrate is transferrable through said stainless steel interface;

wherein said first vacuum chamber, said apparatus, and said second chamber are sealed together to form a closed environment having an internal pressure that is less than standard atmospheric pressure.

21. (Amended) An apparatus through which a substrate is transferred between a first vacuum chamber and a second vacuum chamber, wherein said first vacuum chamber is maintained at a high temperature relative to an ambient temperature of said second vacuum chamber, said second vacuum chamber including a port; said apparatus comprising:

a passageway for receiving said substrate, said passageway including a heating element for maintaining said apparatus at a temperature that is proximate to said high temperature; and

an interface that reduces heat transfer from said first vacuum chamber to said second vacuum chamber, said interface allowing for transfer of said substrate between said apparatus and said second vacuum chamber, said interface having a face with a border disposed on said face, the border defining a hole in said interface having dimensions such that said substrate is transferrable through said interface;

wherein said thermally isolating interface is made of metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft^2)(°F) and wherein said first vacuum chamber, said apparatus, and said second chamber are sealed together to form a closed environment having an internal pressure that is less than standard atmospheric pressure.